

REMARKS

This Amendment A is responsive to the first Office Action on the merits of September 8, 2004. Entry of the following amendments and reconsideration and allowance of claims 1-14 and 16-29 as set forth herein is respectfully requested.

The Status of the Claims

Claims 1 and 13 are objected to for certain informalities.

Claims 1, 2, 4-9, 11-14, 16-22, and 24-29 stand rejected under 35 U.S.C. § 102(a) or alternatively under 35 U.S.C. § 103(a) as being anticipated or alternatively unpatentable over Wu et al., Myocardial Perfusion, Proceedings of the International Society for Magnetic Resonance in Medicine: 9th Scientific Meeting and Exhibition: European Society for Magnetic Resonance in Medicine and Biology: 18th Annual Meeting and Exhibition: held jointly 21-27 April 2001 (Glasgow, Scotland, UK) [hereinafter "Wu et al. ISMRM Proceeding"].

Claim 3 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Wu et al. ISMRM Proceeding in view of Sechtem et al. Stress Functional MRI: Detection of Ischemic Heart Disease and Myocardial Viability, J. Mag. Res. Imaging vol. 10, pp. 667-75 (1999) [hereinafter "Sechtem et al."].

Claims 1, 4, 8, 13, 15, 17-19, 26, and 27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Carroll, U.S. Published Application No. 2003/0045791 A1 [hereinafter "Carroll"] in view of Frank et al., Int'l Published Application No. WO 99/63355 [hereinafter "Frank et al."].

Claims 10 and 23 are indicated as containing allowable subject matter.

The objections to claims 1 and 13 have been addressed

Applicants have amended claims 1 and 13 to address the objections stated in the Office Action. Accordingly respectfully request that the previously stated claim objections to claims 1 and 13 be withdrawn.

Wu et al. ISMRM Proceeding is not "by another"

Applicants respectfully submit that Wu et al. ISMRM Proceeding is not "by another", and thus does not qualify as prior art under 35 U.S.C. § 102(a). See MPEP § 706.02(c).

The inventorship of the present application is: Dee H. Wu, Sara M. Oberrecht, Sara (nmi) Hagey, Agus (nmi) Priatna, and David L. Foxall. The authors of Wu et al. ISMRM Proceeding are Dee H. Wu, Sara Hagey, and Sara M. Oberrecht.

MPEP §§ 716.10, 2132.01, and related sections address the situation in which the cited article includes authors who are not co-inventors.

"[W]here the applicant is one of the co-authors of a publication cited against his or her application, the publication may be removed as a reference by the filing of affidavits made out by the other authors establishing that the relevant portions of the publication originated with, or were obtained from, applicant. Such affidavits are called disclaiming affidavits." MPEP § 2132.01.

In the present situation all authors are co-inventors. There is nothing to "disclaim" by an affidavit. Since the authorship of Wu et al. ISMRM Proceeding is a sub-set of the inventorship of the present application, there are no "other" authors. There is no prima facie case for prior art status under 35 U.S.C. § 102(a) where "it is stated within the publication itself that the publication is describing applicant's work." MPEP § 2132.01. Here, only inventors of the present application are listed as authors of the Wu et al. ISMRM Proceeding – thus, the publication itself states that it is describing applicant's own work. Moreover, Applicants cannot submit disclaiming affidavits, since there are no "other" authors of the Wu et al. ISMRM Proceeding to sign such disclaiming affidavits.

Any person who is an inventor on any claim must be listed as a co-inventor on the application. (37 C.F.R. § 1.45; MPEP § 605). Thus, all listed co-inventors need not contribute to all claims. In an on-going research project it is not uncommon for additional individuals to become inventors as the initial idea is refined and developed into a working prototype and further into a viable product. The citation of a reference by some of the co-inventors against some claims does not establish invention by another.

In conclusion, Applicants expressly do not admit that Wu et al. ISMRM Proceeding qualifies as prior art under 35 U.S.C. § 102(a), and ask that the forthcoming

Office Action withdraw the rejections based on the Wu et al. ISMRM Proceeding.

**Claims 10 and 23, which were indicated as containing allowable subject matter,
have been placed into independent form**

Claims 10 and 23, which were indicated in the Office Action as containing allowable subject matter, have been placed into independent form including limitations of the base claims. Accordingly, it is respectfully submitted that claims 10 and 23 are in condition for allowance, and Applicants therefore respectfully ask for allowance of independent claims 10 and 23 as set forth herein.

Claims 1-6, 8, 9, 11, and 12 patentably distinguish over the references

Claim 1 has been amended to incorporate the subject matter of claim 22. As set forth herein, claim 1 calls for acquiring a parametric map having blood oxygenation level dependent contrast, estimating an improved slice orientation based on the parametric map, and optimizing the slice orientation using at least one iteration of the acquiring and estimating. Claim 1 further calls for, subsequent to the acquiring and optimizing, administering a magnetic contrast agent to the patient and imaging during a transient distribution of the contrast agent in the patient at the optimized slice orientation.

The Office Action does not state any basis in the references for rejecting claim 22. Indeed, the Office Action indicates that claim 23, which specifies one procedure for performing the slice optimization of claim 22, contains allowable subject matter.

For at least these reasons, it is respectfully submitted that claims 1-6, 8, 9, 11, and 12 as set forth herein patentably distinguish over the references of record. Applicants therefore ask for allowance of claims 1-6, 8, 9, 11, and 12 as set forth herein.

**Claims 13, 14, 16-19, 22, and 24-26 as set forth herein patentably distinguish over
the references**

Claim 13 has been amended to incorporate the subject matter of canceled claim 15. Specifically, claim 13 now calls for constructing a parametric map incorporating a diffusion weighted image from the plurality of parametric images.

The Office Action has rejected claim 15 based on the combination of Carroll and Frank et al. In these references, Applicants find mention of diffusion weighted imaging (DWI) only at ¶¶ [0005] and [0006] of Carroll. These paragraphs note that a combination of DWI and cerebral blood flow (CBF) images is useful to delineate regions of viable brain parenchyma at risk for further infarction. The DWI show regions where brain cells have died, and the CBF images show regions with reduced blood flow indicating tissue at risk. One skilled in the art reading Carroll would understand the DWI to provide no information about areas of reduced blood flow, since Carroll teaches using the additional CBF technique to measure reduced blood flow.

Accordingly, one skilled in the art would not be motivated to construct a parametric map incorporating a diffusion weighted image for identifying a pilot parameter used in subsequent contrast agent influx imaging, as called for in claim 13.

For at least these reasons, it is respectfully submitted that claims 13, 14, 16-19, 22, and 24-26 as set forth herein patentably distinguish over the references of record. Applicants therefore ask for allowance of claims 13, 14, 16-19, 22, and 24-26 as set forth herein.

Claims 20 and 21 as set forth herein patentably distinguish over the references

Claim 21 has been placed into independent form, and calls for acquiring a plurality of parametric images with at least one varying imaging parameter, constructing a parametric map from the plurality of parametric images, identifying at least one pilot parameter including at least a volume of interest for a diagnostic image based on the parametric map, and subsequent to the acquiring, administering a magnetic contrast agent to the patient and imaging during influx of the administered contrast agent.

Before or during the acquiring, a second magnetic contrast agent is administered to the patient. The second magnetic contrast agent affects tissue magnetization in a different and distinguishable manner from the contrast agent. The second contrast agent provides parametric image contrast.

Claim 21 stands rejected solely based on Wu et al. ISMRM Proceeding, which Applicants do not acknowledge to be prior art to the present application.

Moreover, Wu et al. ISMRM Proceeding does not teach or fairly suggest using a second magnetic contrast agent during acquisition of the parametric images. The Office Action at ¶ 2 equates the pharmacological stress agent of Wu et al. ISMRM Proceeding with the second contrast agent of claim 21. However, even in its original form claim 21 called for the second contrast agent to affect tissue magnetization. In contrast, a stress agent raises the metabolism to improve BOLD contrast (see present application at least at page 20 lines 1-12). Claim 21 has been amended to further emphasize that the second contrast agent is a second magnetic contrast agent.

Claim 21 also calls for the second magnetic contrast agent to affect tissue magnetization in a different and distinguishable manner from the contrast agent. This is an important aspect, since as noted at least in the present application at page 3 lines 27-35, residual contrast agent left over from a previous contrast agent delivery can interfere with subsequent contrast agent influx imaging.

As set forth in the present application at least at page 16 lines 18-28, by using a second magnetic contrast agent which affects the magnetization in a different and distinguishable manner from the contrast agent used in measuring influx, the parametric imaging can employ a magnetic contrast agent to pilot a subsequent contrast agent influx imaging. Since the second magnetic contrast agent affects the magnetization in a different and distinguishable manner from the contrast agent used in measuring influx, problems with residual contrast agent from the parametric imaging are overcome.

At least for these reasons, it is respectfully submitted that claims 20 and 21 as set forth herein patentably distinguish over the references of record. Applicants therefore ask for reconsideration and allowance of claim 20 and 21 as set forth herein.

Applicants ask for reconsideration and allowance of claims 27-29

Claim 27 calls for (among other elements) a controlling means for acquiring a plurality of images of a region of interest in the patient wherein the plurality of images parametrically depend upon at least one imaging parameter, constructing a parametric map based on the plurality of images, determining optimized imaging conditions based on at least the parametric map, and first-pass imaging during an uptake of an administered contrast agent into the region of interest wherein the first-pass imaging includes contrast due to the administered contrast agent.

Claim 27 stands rejected based on Wu et al. ISMRM Proceeding and alternatively based on Carroll in view of Frank et al.

Applicants have argued earlier herein that Wu et al. ISMRM Proceeding is not "by another" and hence is not available as a prior art reference under 35 U.S.C. § 102(a). Accordingly, Applicants respectfully submit that this rejection should be withdrawn.

Carroll discloses combining diffusion weighted images (DWI) and cerebral blood flow (CBF) images to more precisely delineate regions of brain parenchyma. (Carroll ¶ [0005]). Carroll Fig. 6 suggests that CBF images involve monitoring influx of contrast agent into the region of interest. The Office Action at ¶ 4 acknowledges that Carroll does not address piloting.

Frank et al. suggests combining BOLD imaging with subsequent perfusion or dynamic contrast enhancement imaging. However, Frank et al. does not suggest piloting the subsequent imaging based on the BOLD imaging. At most, Frank et al. disclose at page 6 lines 24-26 following BOLD imaging by more invasive imaging if the BOLD images are of poor quality. There is no disclosure or suggestion of using the BOLD imaging to determine imaging conditions for subsequent influx imaging.

In contrast, claim 27 calls for constructing a parametric map based on a plurality of images parametrically depend upon at least one imaging parameter, and determining optimized imaging conditions based on at least the parametric map.

Claims 28 and 29 stand rejected solely based on Wu et al. ISMRM Proceeding. Applicants have argued earlier herein that Wu et al. ISMRM Proceeding is not "by another" and hence is not available as a prior art reference under 35 U.S.C. § 102(a). Accordingly, Applicants respectfully submit that the rejections of claims 28 and 29 should be withdrawn.

At least for these reasons, it is respectfully submitted that claims 27-29 patentably distinguish over the references of record. Applicants therefore ask for reconsideration and allowance of claim 27-29.

Applicants ask for reconsideration and allowance of claim 7

Claim 7 has been placed into independent form. This claim stands rejected solely based on Wu et al. ISMRM Proceeding, which Applicants argue herein is not "by another" and hence is not available as a prior art reference under 35 U.S.C. § 102(a). Accordingly, Applicants respectfully request that the rejection of claim 7 be withdrawn and that claim 7 be allowed.

Telephone Interview

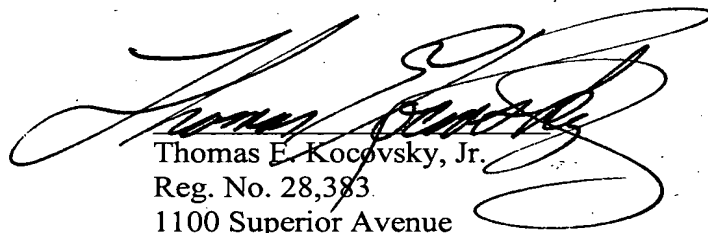
In the event the Examiner considers personal contact advantageous to the disposition of this case, the undersigned may be telephoned at (216) 861 5582.

CONCLUSION

Based on the foregoing, it is submitted that claims 1-14 and 16-29 as set forth herein as set forth herein patentably distinguish over the references of record. Accordingly, reconsideration and allowance of claims 1-14 and 16-29 as set forth herein as set forth herein is earnestly requested.

Respectfully submitted,

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